
Summaries

UDC 681.5

Gaivoronskiy S.A.
VERTEX ANALYSIS OF ROOT QUALITY INDEXES
OF THE SYSTEM WITH INTERVAL PARAMETERS

The characteristic polynomial, the coefficients of which were specified by numerical intervals, has been considered. On the bases of polyvalent interval extension of the root locus method the conditions of membership of the coefficient polyhedron vertex images of root interval bounds have been defined. The principles of finding check vertex polynomial for the analysis of minimal stability degree and maximum variation degree of the system with interval parameters have been developed.

UDC 681.5

Zamyatin S.V.
ARRANGEMENT OF LOCALIZATION REGIONS
OF DOMINANT POLES OF INTERVAL SYSTEM WITH
SUPPORT OF SPECIFIED QUALITY INDEX

The control system with interval specified parameters is considered. The coefficients of characteristic polynomial of the given system include interval specified and adjustable parameters. The approach permitting to arrange localization regions of dominant poles of the interval system with support of required root quality index and localize the rest poles in the specified region of complex plane is proposed.

UDC 513.513

Vylegzhanin O.N., Rybalka S.A.
APPROXIMATION OF MULTITUDE
OF POINT OBSERVATIONS BY ELLIPSE

The question of obtaining the estimations of centre coordinates; length of ellipse axels and their direction with respect to frame of reference located on its surface are discussed. It is shown that the procedure of obtaining estimations could be reduced to the sequences of linear estimation problems and definition of eigenvector and eigenvalue of symmetric real matrix.

UDC 621.397;621.391.883.2

Slobodyan S.M.
THE FRACTALITY OF SIGNAL/NOISE RELATION

The classic definition of signal/noise relation usually used to estimate quantitatively the efficiency of signal recognition in optimal linear filter is discussed. The notion of fractal dimension of signal/noise relation is introduced to use it as a parameter of an object detection in optic-electron and television automatic systems and as a means of control and diagnostics of observation space state.

UDC 004.021

Belousov A.A., Spitsyn V.G., Sidorov D.V.
APPLICATION OF GENETIC ALGORITHMS
AND WAVELET TRANSFORMATIONS
TO INCREASE THE QUALITY OF IMAGES

The two-stage method of increasing the quality of colour image has been developed. The method developed permits to lower the level of noises and at the same time to optimize brightness and contrast of image. To remove noises wavelet filtration is used, to set brightness and contrast genetic algorithm is.

UDC 681.327.1:681.5

Chernyavskiy A.V., Spitsyn V.G.
APPLICATION OF EVOLUBLE NEURAL NETWORK
FOR IMPROVEMENT OF IMAGE QUALITY

The neuroevolutionary method of colour and black-and-white images based on locally adaptive approach to image processing is presented. To improve image neuron network is set by means of genetic algorithm using generalized criterion of quality image estimation based on the range of contrast of the treated picture. The examples of using this method are given.

UDC 517.5

Fadeev A.S., Kochegurova J.A.
PREPARATION OF CONTINUOUS WAVELET TRANSFORMATION
RESULTS FOR AUTOMATED PROCESSING

The disadvantages of continuous wavelet transformations preventing from their being processed automatically when solving the problem of frequency signal constituents classification have been revealed. The heuristic algorithm increasing the isoline projection card self-descriptiveness of wavelet transformation has been proposed. The possibility of using algorithm in preparation of information for further automated processing has been shown.

UDC 681.513.54

Kochegurova J.A., Shebeko J.V.
THE USAGE OF VARIATION SMOOTHING SPLINE
IN THE PROBLEM OF SHORT-TERM FORECASTING

The method of short-term forecasting by means of variation smoothing spline permitting to operate a large number of set up parameters has been suggested. The dependence of forecasting inaccuracy on the parameter values is investigated and their optimal values are found. The comparative analysis of the method with apparatus of artificial neural network in the problem of short-term forecasting is performed.

UDC 621.391;519.72

Avramchuk V.S., Yakovleva J.M.
THE USAGE OF LATTICE PERIODIC FUNCTION IN SPECTRAL
ANALYSIS OF NARROW BAND PERIODIC SIGNALS

The possibility of using the lattice periodic functions in narrow-band signal processing by methods of Fourier's discrete transformation, instantaneous spectral density and synchronous detection providing the decrease in quantity of processed readings is shown.

UDC 681.5.01

Shalaev Yu.N.
SIMULATION OF NON-STATIONARY DYNAMIC SYSTEMS
BY METHOD OF REPRESENTING VECTORS

The synthesis of control signal of the non-stationary dynamic system in vector-matrix form in the desired characteristic of input signal is carried out and the algorithm of estimation of their parameters by method of representing vectors is proposed. This is an operator method that makes any time function at a final interval of time correspond to n -dimensional vector, but linear operator – to matrix. The further transformations necessary for estimation of parameters and system control are made by numerical methods. All these allow to use computer technique efficiently and to write down the final result in the analogue form on the bases of inversion formula.

UDC 539.12.01

Reyzlin V.I.
SLOW ROTATION OF MASSIVE BODIES IN GRAVITATION
THEORY JORDAN-BRANS-DIKKE

The problem on slow rotation of relativistic bodies in scalar-tensor gravitation theory is considered. In the first approximation to angular velocity the equation describing rotation, its external solution and expression for pulse moment is obtained. The results of numerical integration of these equations are presented. In the calculation the equation of neutron-celestial matter state on one-boson replacement model is used. The results obtained are compared with the data of pulsar observation.

UDC 688.518:622.276

Yampolskiy V.Z., Zakharova A.A.,
Ivanov M.A., Chernova O.S.
ANALYSIS OF SOFTWARE FOR THREE-DIMENSIONAL
SIMULATION AND OPTIMIZATION OF OIL AND GAS FIELD
DEVELOPMENT

The most common means and complexes in the market of software applied in Russia and abroad for interpretation of research results and creation of digital 3D models of oil and gas fields are analysed. The technological rules of software module providing performance of the whole job package on simulation of field development are presented. The author's tools (algorithmic and software) to optimize the process of simulating oil and gas field development are proposed. The results of analysis allow to argue the choice of efficient set of tools from arsenal of Russian and foreign software.

UDC 688.518:622.276

Zakharova A.A.
MINIMIZATION OF DIMENSION OF THREE-DIMENSIONAL
MODELS OF OIL AND GAS FIELDS

The algorithm of interval choice of modelling grid desensitization suggested in the paper permits to reveal the most homogenous in filter-capacitive characteristics adjacent layers of oil and gas 3D digital models and in this way to minimize model dimensions. The author's algorithm is the most effective one for model analysis and desensitization formed by means of stochastic methods and tested on the example of oil and gas field models of Tomsk region.

UDC 688.518:622.276

Zakharova A.A.
THE ANALYSIS TECHNIQUE OF OIL AND GAS FIELD DIGITAL
MODELS ON THE BASES OF THEMATIC SURVEY

The technique of analysis of oil and gas field digital models using thematic survey that is traditionally used in other fields is suggested. It permits to carry out the analysis of field development state efficiently and take decisions in choice of the most effective variants. The technique has passed the approbation in performance of feasibility study projects and testing operation of the fields in Tomsk region.

UDC 550.053:510.2+550.053:681.3(571.16)

Ivanchenkov V.P., Vylegzhanin O.N.,
Orlov O.V., Kochegurov A.I., Kozlov A.A.
THE METHODS OF PHASE-FREQUENCY ANALYSIS OF WAVE
FIELDS AND THEIR APPLICATION IN THE PROBLEMS
OF SEISMIC PROSPECTIN DATA PROCESSING

The results of research on development and application of phase-frequency methods of seismic data processing for problem solution of oil-and gas content are discussed. It is shown that application of phase-frequency characteristics of seismic waves allows making high-resolution jam-resistant algorithms for solving the problems of geological cross-section calculation.

UDC 620.165.29:620.176.16

Stepanchenko T.J., Shklyar V.N.
DEVELOPMENT AND RESEARCH OF LEAK DETECTION
ALGORITHMS IN TRUNK PIPELINES ON THE BASES
OF THEIR HYDROGYNAMIC MODELS

The algorithms of leak parameter detection in pipelines obtained by the equation of hydrodynamic processes in them taking place at leakages have been considered. The results of research of the suggested algorithms of leak parameter detection are presented.

UDC 658.012.011.56:681.324

Kovin R.V., Kudinov A.V., Markov N.G., Bogdan S.A.
THE TOOLS OF DEVELOPMENT OF OPERATIONAL DISPATCH
CONTROL SYSTEMS OF GAS-TRANSPORT NETWORK

The problems of operational dispatch control in the branch of gas-transport have been analysed. The principles of development of the branch automated dispatch control systems are suggested. Предложены принципы разработки отраслевых автоматизированных систем диспетчерского управления. The instrumental scheme on the bases of these principles is described.

UDC 504.064(4)

Zamyatin A.V., Mikhailov P.V., Cabral P.
MODERN MEANS OF SOLVING THE PROBLEMS
OF DYNAMICS ANALYSIS AND FORECASTING
THE CHANGES OF LANDSCAPE TOPSOIL

The approach to the determination of functioning cellular automata rules distinguished by joint use of four spatial characteristics and permitting to increase modelling adequacy is suggested. The comparative analysis of the suggested approach is performed to solve the problem of dynamics analysis and forecasting landscape topsoil by the example of natural-territorial complex of Portugal.

UDC 004.89

Axyonov S.V., Novoseltsev V.B.
INCREASING THE QUALITY OF SCENE RECOGNITION
BY NEURAL NETWORK "NEOCOGNITRON"

The basic principles of learning and using neural network "Neocognitron" are presented. The peculiarities of Neocognitron modifications invariant to rotation and with variable selectivity are shown. The variants of extension of the given paradigm to decrease the network redundancy are suggested.

UDC 681.513.6

Vichugov V.N.
NEURAL NETWORK METHOD OF TEACHING
IN THE PROBLEMS OF AUTOMATIC CONTROL

The method of adaptive control system construction the basis for functioning of which is the method of teaching is considered. A software tool for modelling and research of such control systems is described. The technique of using artificial neural networks to give the function of impact estimation is proposed.

UDC 62-192:519.713

Yefremov A.A.
E-NETWORK MODELLING OF SERIES-PARALLEL
ENGINEERING SYSTEM RELIABILITY WITH RECOVERY

The possibility of processes simulation of failure-recovery of series-parallel engineering systems using E-network device is shown. The networks for different types of parallel reservation have been developed. The possibility of reliability simulation of the objects restored is taken into consideration.

UDC 681.3.06

**Malchukov A.N., Osokin A.N.
EFFICIENCY OF BLOCK BINARY
INTERFERENCE IMMUNITY CODES**

The question of efficiency of block binary noise combating codes for correction of independent errors or their bursts has been considered. The graphs of efficiency of correcting block binary interference immunity combating codes are presented.

UDC 519.874

**Zamyatina O.M., Tyulmenkov V.N.
THE ORGANIZATION METHODS AND ALGORITHMS
OF ADDRESS REPOSITORY**

The methods of address repository have been considered and the author's personal method is proposed which is realized in the form of algorithms of automated placement and automatic selection of goods when fulfilling an order. The algorithms are realized in the form of module "Address repository" for the enterprise "Lama" Limited company (Tomsk).

UDC 004.65

**Pinzhin A.J.
APPLICATION OF PROBABALISTIC ALGORITHMS
OF RECORDING CONNECTION FOR EXCLUDING
INFORMATION DUPLICATING IN CORPORATE DATABASE**

The possibility of using probabilistic algorithm of recording connection to remove information duplicating in database of a large company or enterprise is considered. The theoretical basis of the algorithm are presented, the ways of similarity measure estimation of the main attribute types are suggested, the possibilities of improving the model by taking into account the data credibility value from different sources. The results of the work are given by the example of the problem of removing recording duplicate about natural persons in the database of a Russian university.

UDC 519.245:519.688

**Khamukhin A.A.
APPLICATION OF ADAPTIVE BINORMAL DISTRIBUTION
IN THE SEARCH METHOD OF GLOBAL MINIMUM
SIMULATED ANNEALING**

In the search method of global minimum Simulated Annealing the binormal distribution of probability density of the next step, the modes of which are displaced with respect to the current local minimum, but the distance between them and dispersion are functionally connected with artificial temperature is suggested to use. The efficiency of approach realization by means of numerical calculation is shown.

UDC 004.89

**Novoseltsev V.B., Kopanitsa G.D.
NONGOAL-ORIENTED STRATEGY OF FORMULA
INTRODUCTION IN MODAL CALCULUS**

The approach to analysis of modal calculus formula CTI based on Maslov's reverse method is proposed and grounded. The approach proposed is oriented to create the systems of automated proof of theorems and is intended for construction of cognitive system of wide range. The F-ordering relation is suggested on the bases of which the strategies of input space reduction are formulated.

UDC 004.89

**Kovalenko D.A., Novoseltsev V.B.
STRATEGY OF FORMULA DEDUCIBILITY IDENTIFICATION
IN STRUCTURAL FUNCTIONAL MODELS**

The recursive statement calculus for the theory of structural functional models has been considered. The questions of solvability and completeness of calculus are investigated. The strategy and algorithm of identification of calculus formula deducibility are suggested, the algorithm correctness is shown and the estimation of its efficiency is defined.

UDC 004.89

**Novoseltsev V.B., Sokolova V.V.
PROCESSING RECURSIVE DATA BY FINITE STATE MACHINE**

An alternative to standart formal approach to the processing of recursive data has been suggested. The main idea is a prime functionality, but not data. Functionality is realized by the mechanisms based on the theory of finite state machine. The results obtained permit to apply new methods to create a natural description of knowledge domain containing recursive structures, which, in its turn, increases the efficiency of such data manipulation.

UDC 002.53:004.89

**Tuzovskiy A.F.
WORKING AT ONTOLOGICAL MODEL OF ORGANIZATION
ON THE BASES OF DESCRIPTIVE LOGIC**

The sequence of ontology model transformation into the model of descriptive logic using the system of logic conclusion has been considered. As a support system in operation of the descriptive logic model the system of RACER logic input has been used. The method of checking the ontology accuracy on the bases of query proof of descriptive logic model satisfiability is presented.

UDC 002.53:004.89

**Tuzovskiy A.F.
ONTOLOGY COMBINATION METHOD
OF THE KNOWLEDGE DOMAINS**

The suggested method of ontological model combination permits to form a coordinated general model of different branches of knowledge with insignificant assistance of the specialists. The validity of the ontology obtained is checked by using the methods of descriptive logic. The properties of the suggested operation of ontology combination are considered.

UDC 002.53:004.89

**Tuzovskiy A.F.
ACHITECTURE OF SEMANTIC WEB-PORTAL**

The development of architecture of Web-portal on the bases of using basic subsystem on the operation of semantics of data entity is suggested. The given subsystem realizes the work with ontological model and semantic metadescriptions of all the portal objects containing information. It permits to solve the problems on the work with object content.

UDC 658.512.011.56.005:004.9

**Yehlakov Yu.P., Zhukovskiy O.I., Rybalov N.B.
THE PRINCIPLES OF WEB-ORIENTED GIS CONSTRUCTION
OF INDUSTRIAL ENTERPRISE**

The problems of production infrastructure management of an industrial enterprise have been analysed. The technique of access to the electron general layout is suggested. The universal architecture of WEB-oriented GIS of industrial enterprise is described.

UDC 658.012:004.42

**Anikin A.S., Dmitrieva J.A., Tsapko G.P., Tsapko S.G.
VERTUAL ENTERPRISE OF TOMSK POLYTECHNIC UNIVERSITY
ON THE BASES OF THE MODERN TECHNOLOGY**

The importance of application of new information technologies in scientific, educational, and production fields is revealed. The role of ERP- and PDM-systems in the chain of construction of a modern high technological enterprise is shown. The structure of a virtual enterprise on the bases of processes of interaction among the participants of a production life cycle is suggested. The possibility of realizing the contraction principles within the scientific-educational divisions of Tomsk polytechnic university is shown. The necessity of creation of TPU virtual enterprise to increase the education quality of TPU students of different specialties in team projects of complex tasks is justified.

UDC 658.012:004.42

Tsapko G.P., Tsapko S.G.
THE STRATEGY OF DEVELOPMENT OF CALS-TECHNOLOGY
IN TOMSK POLYTECHNIC UNIVERSITY

The development of advanced technology enterprise in the modern market conditions has been analysed. The main goals and problems of development of new information technologies in the field of science, education, and production are revealed. The fundamental directions of CALS-technology development in scientific and educational field are defined. The history of particular direction development in TPU forming the strategy positions of CALS-methods is shown. The strategy of introduction and development of CALS-technology in science and education in TRU is developed. The recommendations are given and the layout of the main actions is formulated.

UDC 681.3.06

Pogrebnov A.V.
DETERMINATION OF NUMBER AND TOPOLOGY OF STATION
DISTRIBUTION OF MULTIPROCESSOR COMPUTER SYSTEM

The problems of topology design of multiprocessor computer system for managing the objects with geographically distributed equipment have been considered. The source data are the coordinates of sensor and actuator location (terminal points) on the topological field of managing object and a set of microprocessor stations. In the job class of mathematical programming the statements and methods of problem solving on the determination of the number of computer system stations, the places of their distribution on the object topological field, the distribution of terminal points over the stations are suggested. The concept of compact partitioning of the topological field points into subsets is introduced. Some properties of compact and local compact partitioning are presented.

UDC 004.891

Starodubtsev G.V., Silich M.P., Silich V.A.
DEVELOPMENT OF TOOLS FOR CONSTRUCTION
OF INTELLECTUAL OBJECT-ORIENTED MODELS TO
SUPPORT DECISION MAKING

The architecture and realization of information system for decision making support on the bases of object-oriented models and functional dependences of attributes is suggested. The possibility of integration into the model of different methods of artificial intellect is shown.

UDC 651.51

Malysenko A.M.
APPLICATION OF REDUNDANT DIMENSION CONTROLS
IN AUTOMATION OF CONTROLLED OUTPUTS
OF MULTIDIMENSIONAL REGULATION OBJECTS

The data of impact of redundant dimension controls on automating the outputs of stationary linear dynamic objects have been systemized; the algorithms of synthesis providing such effect of precancellers and feedbacks on state and output have been suggested.

UDC 681.511.4

Skorospeshkin M.V.
ADAPTIVE PSEUDOLINEAR CORRECTORS OF DYNAMIC
CHARACTERISTICS OF AUTOMATIC CONTROL SYSTEMS

The adaptive pseudolinear amplitude and phase correctors of dynamic features of automatic control systems are suggested. The research of automatic regulation system features with adaptive correctors has been carried out. The efficiency of using the pseudolinear adaptive correctors in the automatic regulation systems with non-stationary parameters is shown.

UDC 621.311.6

Kazmin G.P., Korolyov S.I., Korolyova N.I.,
Melnikov P.Yu., Kotov A.A.
CONSTRUCTION OF COMPUTER UNINTERRUPTED SUPPLY
SYSTEMS ON THE BASES OF CONTINUOUS CURRENT
SYSTEMS

The techniques of construction of the computer uninterrupted supply systems with exclusion of redundant energy conversion are shown. New systems of uninterrupted supply with improved mass-size factors and efficiency due to operation of elements on high frequencies as well as high reliability are suggested.

UDC 621.314.6

Belitskaya L.A.
POLYPHASE CONVERTER OF POWERFUL DC MOTOR

The possibility of realization of powerful polyphase converters, the key elements of which are operated by pulses of uniform phase displacement in time and digital code of off-duty factor task is shown.

UDC 338.24:004(075.8)

Yurieva I.V.
METHOD OF PLANNING INVESTMENTS INTO
THE PRODUCTION OF HIGH TECHNOLOGY ON THE BASES
OF INNOVATION POTENTIAL MATRIX OF A REGION

The method including definition of priority for a region critical technologies and innovation enterprises, estimation of investment risk at different stages of high technology production, calculation of capitalized income and costs of risks, problem solution of optimal investment distribution in types of production and enterprise is presented.

UDC 338.24:004(075.8)

Silich V.A., Yurieva I.V.
CONSTRUCTION AND APPLICATION OF LIFE CYCLE MODEL
OF INNOVATION PRODUCTION FOR ITS PRODUCTION
MANAGEMENT AND REALIZATION

To manage the innovation activity of an enterprise it has been suggested to construct the economic-mathematical model of production life cycle which is adapted for current sale conditions. In this way the possibility of modern correction of production plans and sales of products is provided.

UDC 004.652

Mokina H.J.
THE PLACE OF STRATEGICAL MANAGEMENT SYSTEM
IN UNIFORM UNIVERSITY INFOMEDIA

The importance of using toolbox of strategic management for universities is grounded. The information problems are formulated and the place of the given system in uniform infomedia of university is defined.

UDC 519.24+681.5

Istigeicheva H.V., Mitsel A.A.
FORECASTING THE CHANGES IN QUOTATIONS
OF FINANCIAL INSTRUMENTS ON THE BASES
OF STOCHASTIC VOLATILITY MODEL

The model of stochastic volatility has been considered. The model parameters are estimated by the method of sequential analysis. Modelling of financial instrument quotation by the example of European currency is carried out.

UDC 519.886,519.688

Grigoriev V.P., Kozlovskih A.V., Maryasov D.A.
APPLICATION PROGRAM PACKAGE FOR ANALYSIS AND
FORECASTING OF STOCK EXCHANGE INFORMATION

The application program package which allows a user to get the prediction realization in a suitable form and in automatic mode is described. The mathematical tool is based on universal model for forecasting different exchange characteristics, such as price, auction volume, the number of open positions, two-parameter indicators, and integral parameters. Within the program product a new approach of forecasting the trend changing is considered. A detailed description of algorithms forming the program package and user's interface is given.

UDC 519.876.2(65.011.56)

Ozerova I.G.
COMPARISON OF TRADITIONAL METHODS OF BUSINESS
PROCESS DESCRIPTION AND LANGUAGE
OF THEIR PERFORMANCE

The transformation of business processes description made with the help of traditional methods, for example, DFD (Data Flow Diagram) into BPML (Business Process Execution Language) is suggested. For this purpose these methods have been compared. The rules of business process scheme development on the bases of data flow diagram, the constructions of which are compared with the elements of BPML language are obtained.

UDC 681.3

**Gaidarova M.V., Gromakov J.I.,
Voronin A.V., Malysenko A.M.**
**SETTING UP EFFICIENT BUSINESS OF SERVICE CENTRE
ON THE BASES OF MODEL DESCRIPTION
OF BUSINESS PROCESSES**

The analysis of organization peculiarities is carried out and the possibility of setting up effective business of domestic appliance repair service centre on the bases of its business process model description in Microsoft Visio application program package is grounded.

UDC 657

Shelestov A.A.
**CHARACTERISTIC OF RESOURCES NECESSARY
FOR RUSSIAN SMALL-SCALE ENTERPRISE TRANSFERRING
INTO ACCOUNT INTERNATIONAL STANDARDS**

In Russia the preparation of accounting in international standards is connected with a number of problems: getting a consultant's services, additional information gathering, purchasing new software, personnel training to meet new requirements. To carry out the project on account transformation successfully all these problems are to be taken into consideration and solved with the least explicit costs of the enterprise at transfer into account international standards.

UDC 681.5:658.261

Silich V.A., Silich M.P., Yavorskiy M.I.
**SYSTEM APPROACH TO CONCEPT DEVELOPMENT OF LEGAL
BASE IN RENDERING PUBLIC SERVICES**

To develop the concept of legal base in rendering public services it is proposed for the first time to use system project technology of complex social-economic systems based on the object-oriented modelling method. The use of system project technology gives completeness and complexity of considering problems, purposes, principles, and means of providing citizens with guarantee of civil entitlement realization on public services.

UDC 681.3.06:378

Botygin I.A., Popov V.N.
**AUTONATION SYSTEM OF REMOTE DOCUMENT
FORMATTING OF ESTIMATION MEANS FUND
OF PROFESSIONAL EDUCATIONAL PROGRAMMES**

The software complex providing infotainment of remote formatting and current documentation collection of estimation means fund in governmental certification and accreditation of educational programs is described. The main function of the software complex is systematization and transaction of current documentation connected with certification of educational programs of higher professional education in estimation of higher school activity.

UDC 37.014;316.33

Yampolskaya L.I.
**INTEGRATIVE PROCESSES IN MODERN UNIVERSITY
EDUCATION AND THE PHENOMENON OF GLOBALIZATION**

The integrative processes in modern university education, the problems of multiculturalism of educational programs are considered. The difference of disciplinary scientific structure, the absence of universal standards, real diversity of educational traditions, ideological orientation present definite obstacles for integrative processes. The Bologna Declaration is one of the most significant documents in the sphere of education integration for United Europe as well as involving the European countries at the periphery of the union in this process. The admission of convenient comparable system of clear and compatible degrees contributes to international competitiveness of the European higher education.

UDC 37.014;316.33

Yampolskaya L.I.
**UNIVERSITY EDUCATION IN KNOWLEDGE SOCIETY:
FUTUROLOGIC INTERPRETATION**

The role of university as a main stabilizing institution in the knowledge society is considered. The central and key mission of university consists in support of innovations. Keeping in mind the ability of university to adapt one can hope that in the global world it can reserve for itself both a role of leading centre of knowledge and a role of guarantor of academic order and stability that can become even more important. The scale of reconstructions necessary for successful competitiveness in the global society of knowledge requires from university to give up its fundamental values in order to adapt to the demands of new epoch of globalization.

UDC 004.855

Nemirovskiy V.B., Stoyanov A.K.
**REALIZATION OF VARIABILITY OF COMPUTER TESTING
OPEN FORM**

The realization of systems of open form of computer knowledge testing to check knowledge in the basis of programming and academic subjects on which questions require formulation of detailed answers is described. The peculiarities of testing system realization, their content, stages of work on them are considered.

UDC 681.3.01

Beresteneva O.G., Marukhina O.V., Abunavas H.A.
**ALGORITHM AND SOFTWARE OF INFORMATION SYSTEM
OF STUDENTS' COMPETENCE ESTIMATION IN A TECHNICAL
HUGHES SCHOOL**

The algorithm of students' competence estimation based on the model of fuzzy estimation is suggested as well as the description of program complex for solving the problems of students' competence estimation is presented. Special attention is paid to the questions of estimation algorithm development of competence components on the bases of expert estimation and test technologies.

UDC 007(091)

Yampolskiy V.Z.
**INTEGRATION OF SCIENTIFIC, EDUCATIONAL, AND PRO-
DUCTION ACTIVITIES IN THE CYBERNETIC CENTRE OF TPU**

Fundamental and applied research, establishment and development of scientific-pedagogical schools, training engineers and scientists in the important fields of science, engineering and technology were and are the sphere of strategic interest at all stages of TPU history. At the time of advent and rapid development of computer engineering, its elemental base, programming, applied mathematics and information there appears a new branch in the tree of TPU, a new direction, new structure – Cybernetic centre.

UDC 001.89:004.9:929

Markov N.G.
**LEADING SCIENTIFIC SCHOOL IN GEOINFORMATICS
AND GEOINFORMATIC TECHNOLOGIES**

The history of foundation and the staff of leading scientific school on geoinformation and geoinformation technologies of Tomsk polytechnic university are considered. The most significant scientific results achieved by the school and the results of scientific-social recognition of the school are described.